

NAME

Key

DATE

SCORE

## Geometric Means; Pythagorean Theorem

Simplify the expressions.

1.  $\sqrt{100} = 10$

2.  $2\sqrt{9} = 6$

3.  $\sqrt{50} = 5\sqrt{2}$

4.  $\frac{3}{4}\sqrt{64} = 6$

~~5.  $\sqrt{\frac{1}{9}} = \frac{1}{3}$~~

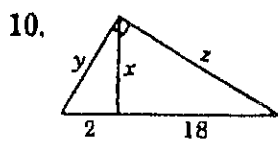
~~6.  $\frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$~~

Find the geometric mean between the two numbers.

7. 6 and 24  $\frac{6 \cdot 24}{6+24} = 12$

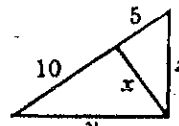
8. 3 and 27  $\frac{3 \cdot 27}{3+27} = 9$

9. 3 and 64  $\frac{3 \cdot 64}{3+64} = 8\sqrt{3}$

Each diagram shows a right triangle with the altitude drawn to the hypotenuse. Find the values of  $x$ ,  $y$ , and  $z$ .

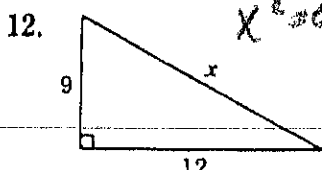
$$\frac{z}{x} = \frac{x}{18} \quad \frac{z}{y} = \frac{y}{20} \quad \frac{18}{z} = \frac{z}{20}$$

$$x = 6, y = 2\sqrt{10}, z = 6\sqrt{10}$$

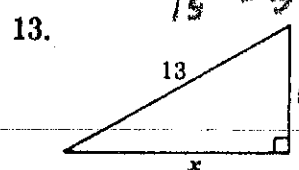


$$\frac{5}{x} = \frac{x}{10} \quad \frac{10}{y} = \frac{y}{15} \quad \frac{5}{z} = \frac{z}{15}$$

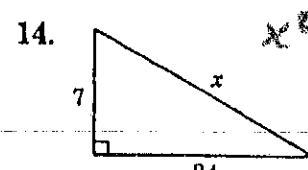
$$x = 5\sqrt{2}, y = 5\sqrt{6}, z = 5\sqrt{3}$$

Find the value of  $x$ .

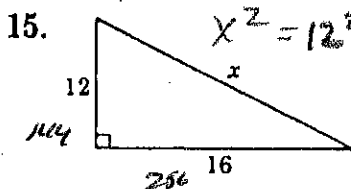
$$x = 15$$



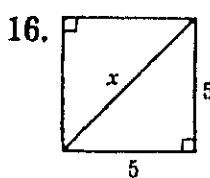
$$x = 12$$



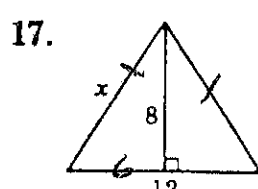
$$x = 25$$



$$x = 20$$

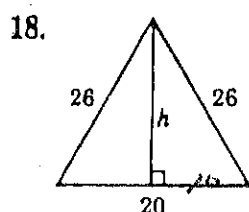


$$x = 5\sqrt{2}$$



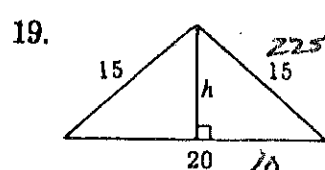
$$x = 10$$

Find the length of the altitude to the base of the isosceles triangle.



$$h = 24$$

$$26^2 = h^2 + 20^2$$



$$h = 5\sqrt{3}$$

$$15^2 = h^2 + 10^2$$

$$125 = h^2$$

## TEST 20 The Pythagorean Theorem (Sections 6-1, 6-2)

Directions: Write answers in the spaces provided.

For Questions 1-4, simplify each expression.

1.  $\frac{\sqrt{20}}{2\sqrt{5}}$

2.  $\frac{2\sqrt{8}}{4\sqrt{2}}$

3.  $\sqrt{\frac{5}{9}} \cdot \frac{\sqrt{5}}{3}$   ~~$\sqrt{\frac{3}{10}}$~~

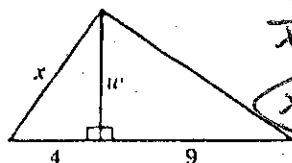
For Questions 5-7, find the geometric mean between the given numbers.

5. 2 and 18  $\sqrt{2 \cdot 18} = 6$

6. 1 and 49  $\sqrt{1 \cdot 49} = 7$

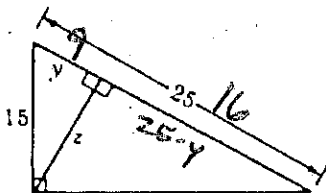
7.  ~~$\frac{1}{2}$  and  $\frac{2}{5}$~~

Each figure shows the altitude drawn to the hypotenuse of a right triangle. Find each value in simplest form.

8. a. Find  $w$ .b. Find  $x$ .9. a. Find  $y$ .b. Find  $z$ .

$$\frac{4}{x} = \frac{x}{13}$$

$$x = 2\sqrt{13}$$



$$\frac{y}{15} = \frac{15}{25}$$

$$5y = 45$$

$$y = 9$$

$$\frac{9}{z} = \frac{z}{16}$$

$$z = 12$$

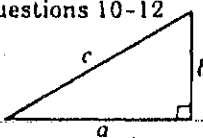
Given the right triangle shown. Find each value in simplest form.

10. If  $a = 8$  and  $b = 6$ , find  $c$ .  $c = 10$

11. If  $a = 6$  and  $b = 3$ , find  $c$ .  $c = 3\sqrt{5}$

12. If  $b = \sqrt{17}$  and  $c = 9$ , find  $a$ .  $a = 8$

Questions 10-12



#10  $c^2 = 6^2 + 8^2$

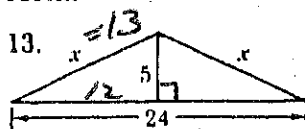
#11  $c^2 = 6^2 + 3^2$

#12

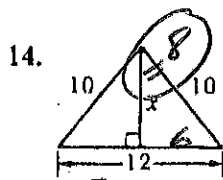
$9^2 = a^2 + 17^2$

$81 = a^2 + 17$

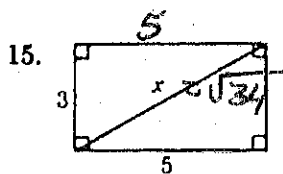
$64 = a^2$

For Questions 13-15, find the value of  $x$  in each figure in simplest form.

$$x^2 = 5^2 + 12^2$$



$$10^2 = x^2 + 6^2$$



#15

$$x^2 = 3^2 + 5^2$$

$$9 + 25$$

$$x^2 = 34$$

Determine if the  $\Delta$ s are acute, right, or obtuse.① Acute

$$4, 5, 6$$

$$36 < 16 + 25$$

③ R

$$1, \sqrt{7}, 2\sqrt{2}$$

$$8 = 1 + 7$$

② Obtuse

$$6, 8, 12$$

$$144 > 36 + 64$$

④ R

$$5, 12, 13$$

$$169 = 25 + 144$$